Vanasse & Associates inc
Transportation Engineers & Planners

35 New England Business Center Drive
Suite 140
Andover, MA 01810

Ref: 8460

March 3, 2021

Ms. Kathryn A. Joubert
Town Planner
Northborough Town Hall
63 Main Street
Northborough, MA 02341

Re: Response to Transportation Impact Assessment Peer Review
Proposed Laboratory/Manufacturing Facility – 425 Whitney Street
Northborough, Massachusetts

Dear Ms. Joubert:

Vanasse & Associates, Inc. (VAI) is providing responses to the comments that were raised in the February 25, 2021 *425 Whitney Street Transportation Impact Assessment Peer Review* prepared by Environmental Partners (EP) in reference to their review of the January 21, 2020 *Transportation Impact Assessment* (the "January 2020 TIA") prepared by VAI in support of the proposed laboratory/manufacturing facility to be located at 425 Whitney Street in Northborough, Massachusetts (hereafter referred to as the "Project"). Listed below are each of the comments raised in EP's letter that required a response or additional information followed by our response on behalf of the Applicant.

Existing Conditions

Comment: *The TIA indicates the project is expected to generate fewer vehicles than the existing/former usage. As such, VAI only included one study roadway and no study intersections as part of the study area, and therefore did not perform traffic analysis as part of this assessment. It is unclear based on the information provided whether or not the previous occupant still occupied the site as an existing usage at the time the traffic counts were completed in November 2019 and whether or not the occupancy was recent enough to be considered an existing condition.* ***EP requests clarification on the status of the previous occupant.***

Response: The previous occupant of the subject building and property (Metrie Interior Moldings and Doors) was active within the past 3 years and, consistent with the standards of the Massachusetts Environmental Policy Act (MEPA) and the Massachusetts Department of Transportation (MassDOT), uses that were active within the past 3-years can be considered when evaluating the "as-of-right" reuse of a property to establish the comparative impact of new development or redevelopment. Metrie relocated its operations to 301 Bartlett Street in Northborough in May 2019.

Project-Generated Traffic

Comment: *VAI used 49,000 sf of occupied space to calculate the trip generation and did not account for the 20,228 sf of storage/warehouse space.* ***EP requests clarification on what justification and standard was used as the basis for using the partial square-footage.***

Response: The functional disposition of the 69,228± square foot (sf) building will include 49,000± sf of office, laboratory and manufacturing space, and 20,228± sf of associated storage and warehouse space. There will be no employees assigned to the storage/warehouse space and, as such, this space will not produce traffic. That being said, including the storage and warehouse space would increase the peak-hour traffic volume projections for the Project by six (6) vehicle trips during the weekday morning peak-hour and by eight (8) vehicle trips during both the weekday evening and Saturday midday peak hours. The resulting peak-hour trip calculations for the Project would be 34 vehicle trips during the weekday morning peak-hour, 29 vehicle trips during the weekday evening peak-hour and 28 vehicle trips during the Saturday midday peak-hour.

Alternatively, it is anticipated at approximately 20 employees will be assigned to the proposed facility. Using the number of employees as the independent variable would result in nine (9) vehicle trips during the weekday morning peak-hour, seven (7) vehicle trips during the weekday evening peak-hour and two (2) vehicle trips during the Saturday midday peak-hour.

Using either methodology, the predicted traffic volumes that are associated with the Project are relatively minor and, when dispersed over the respective peak hours, would not result in a significant increase in motorist delays or vehicle queuing over existing conditions.

Comment: *VAI used ITE's fitted curve methodology in establishing proposed trips; however, given the available sample points, one could argue using average rate methodology. With the evaluated 49,000 sf of occupied space, the morning peak hour would increase from the projected 26 trips to 34 trips and the evening peak hour would increase from 23 trips to 31 trips, which is either at or slightly above the existing trips. If the higher square footage is used, the difference in trips would almost double.* ***EP requests clarification on the selected trip-generation methodology.***

Response: The Institute of Transportation Engineers (ITE)[1] recommends that the fitted curve equation be used to establish the trip characteristics for a land use when an equation is provided and there are more than 20 data points available for the land use under study. A review of the ITE trip-generation data for Land Use Code (LUC) 110, *General Light Industrial*, indicates that the LUC meets the recommended practice for use of the fitted curve equation.

[1] *Trip Generation Handbook*, 3rd Edition, A Recommended Practice of the Institute of Transportation Engineers; Institute of Transportation Engineers; Washington, D.C.; September 2017.

Comment: *As discussed under the Existing Conditions section above, VAI did not include study intersections or traffic analysis given their anticipated reduction in vehicle trips for the proposed facility compared to the former use. Based solely on the TIA's findings, it appears that the proposed site generated volumes equate to one vehicle every two or three minutes which will likely result in negligible or minor delays and would be anticipated to be less than the former use. However,* ***EP requests clarification regarding the above-discussed trip generation methodology, proposed development size, and the status of the former use before commenting on the accuracy of trip generation and the potential need for further evaluation.***

Response: Responses have been provided to EP's comments and affirm that the Project will result in comparable traffic volumes to the former use that occupied the Project site.

Sight Distance

Comment: *During our site visit, EP measured the sight distance from the location of the proposed site driveway along Whitney Street. We agree that with selective vegetation clearing, the required minimum sight distance should be met.* ***We request that the Applicant provide sight triangles for the proposed driveway on the site plans to indicate areas where all objects and vegetation should be removed and/or maintained below a height of 2.5 feet.***

Response: The sight triangle areas will be added to the Site Plans along with a note stating "Signs, landscaping and other features located within sight triangle areas shall be designed, installed and maintained so as not to exceed 2.5-feet in height. Snow windrows located within sight triangle areas that exceed 3.5-feet in height or that would otherwise inhibit sight lines shall be promptly removed."

We trust that this information is responsive to the comments that were raised in the February 25, 2021 *425 Whitney Street Transportation Impact Assessment Peer Review* prepared by EP in reference to the Project. If you should have any questions or would like to discuss our responses in more detail, please feel free to contact me.

Sincerely,

VANASSE & ASSOCIATES, INC.

Jeffrey S. Dirk

Jeffrey S. Dirk, P.E., PTOE, FITE
Managing partner

Professional Engineer in CT, MA, ME, NH, RI and VA

JSD/jsd

Attachments

cc: File

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DATA SOURCE:
Trip Gen Manual, 10th Ed + Supplement

SEARCH BY LAND USE CODE:
110

LAND USE GROUP:
(100-199) Industrial

LAND USE:
110 - General Light Industrial

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

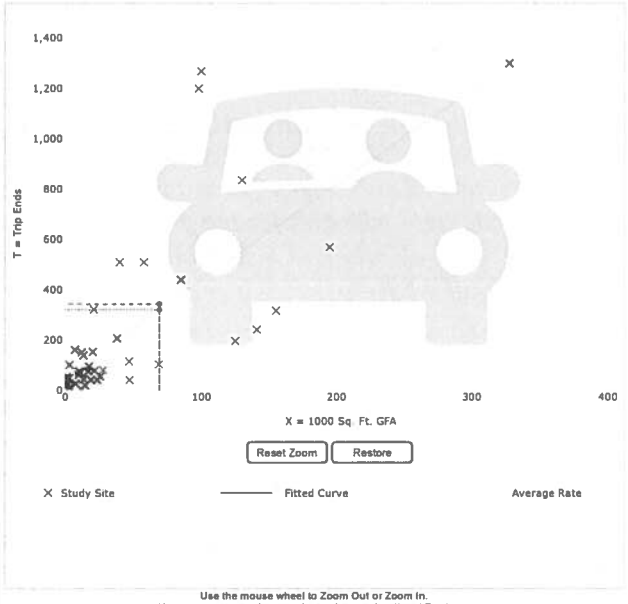
TIME PERIOD:
Weekday

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
69.23 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
General Light Industrial (110) Click for more details

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
40

Avg. 1000 Sq. Ft. GFA:
49

Average Rate:
4.96

Range of Rates:
0.34 - 43.86

Standard Deviation:
4.20

Fitted Curve Equation:
T = 3.79(X) + 57.96

R^2:
0.54

Directional Distribution:
50% entering, 50% exiting

Calculated Trip Ends:
Average Rate: 343 (Total), 171 (Entry), 172 (Exit)
Fitted Curve: 320 (Total), 160 (Entry), 160 (Exit)

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DATA SOURCE:
Trip Gen Manual, 10th Ed + Supplement

SEARCH BY LAND USE CODE:
110

LAND USE GROUP:
(100-199) Industrial

LAND USE:
110 - General Light Industrial

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

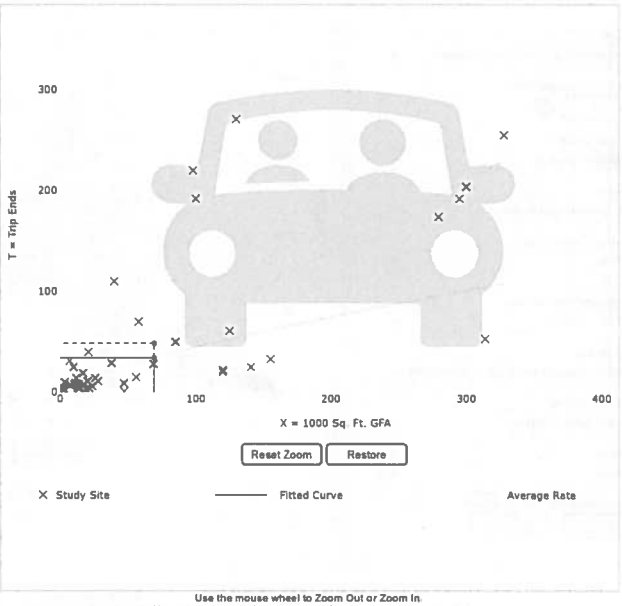
TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
69.23 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
General Light Industrial (110) Click for more details

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
45

Avg. 1000 Sq. Ft. GFA:
73

Average Rate:
0.70

Range of Rates:
0.02 - 4.46

Standard Deviation:
0.65

Fitted Curve Equation:
Ln(T) = 0.74 Ln(X) + 0.39

R^2:
0.52

Directional Distribution:
88% entering, 12% exiting

Calculated Trip Ends:
Average Rate: 48 (Total), 42 (Entry), 6 (Exit)
Fitted Curve: 34 (Total), 30 (Entry), 4 (Exit)

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SEARCH BY LAND USE CODE:
110

LAND USE GROUP:
(100-199) Industrial

LAND USE :
110 - General Light Industrial

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

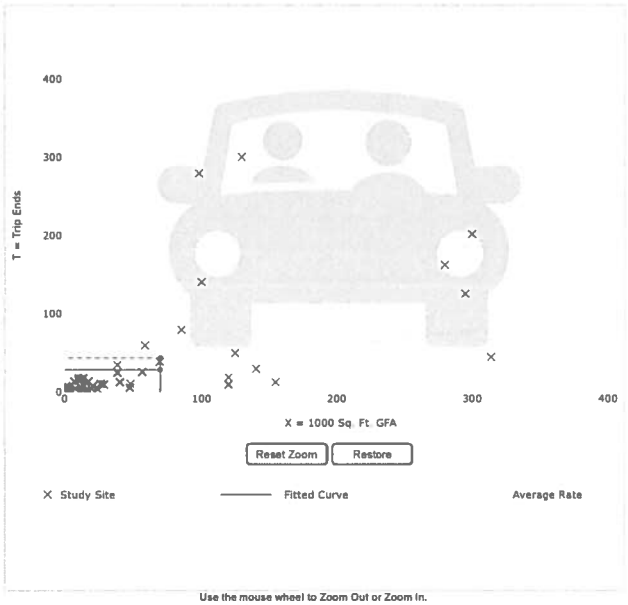
TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
69.23 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values

DATA STATISTICS

Land Use:
General Light Industrial (110) Click for more details

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
44

Avg. 1000 Sq. Ft. GFA:
67

Average Rate:
0.63

Range of Rates:
0.07 - 7.02

Standard Deviation:
0.68

Fitted Curve Equation:
Ln(T) = 0.69 Ln(X) + 0.43

R^2:
0.52

Directional Distribution:
13% entering, 87% exiting

Calculated Trip Ends:
Average Rate: 44 (Total), 6 (Entry), 38 (Exit)
Fitted Curve: 29 (Total), 4 (Entry), 25 (Exit)

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SEARCH BY LAND USE CODE:
110

LAND USE GROUP:
(100-199) Industrial

LAND USE:
110 - General Light Industrial

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Saturday

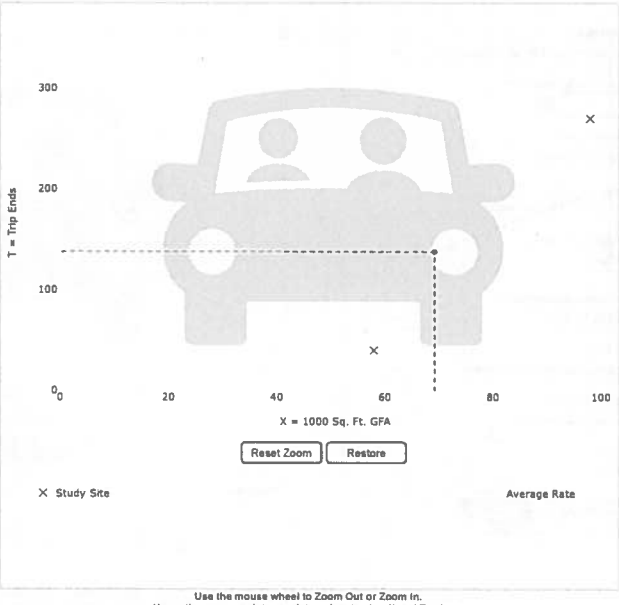
SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
69 23
Calculate

Data Plot and Equation

Caution – Small Sample Size



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Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
General Light Industrial (110) Click for more details

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Saturday

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
2

Avg. 1000 Sq. Ft. GFA:
78

Average Rate:
1.99

Range of Rates:
0.69 - 2.76

Standard Deviation:
****

Fitted Curve Equation:
Not Given

R^2:
****

Directional Distribution:
50% entering, 50% exiting

Calculated Trip Ends:
Average Rate: 138 (Total), 69 (Enter), 69 (Exit)

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DATA SOURCE:
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SEARCH BY LAND USE CODE:
110

LAND USE GROUP:
(100-199) Industrial

LAND USE:
110 - General Light Industrial

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Saturday, Peak Hour of Generator

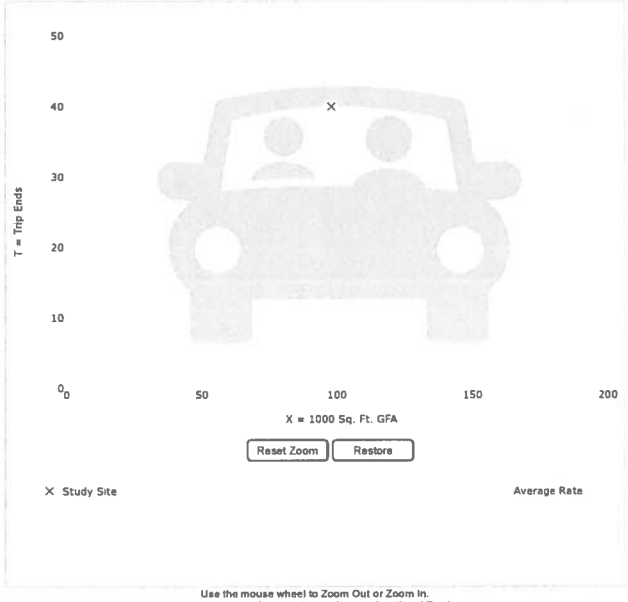
SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
69.23 Calculate

Data Plot and Equation

Caution – Small Sample Size



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
General Light Industrial (110) Click for more details

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Saturday
Peak Hour of Generator

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
1

Avg. 1000 Sq. Ft. GFA:
98

Average Rate:
0.41

Range of Rates:
0.41 - 0.41

Standard Deviation:
****

Fitted Curve Equation:
Not Given

R^2:
****

Directional Distribution:
47% entering, 53% exiting

Calculated Trip Ends:
Average Rate: 28 (Total), 13 (Entry), 15 (Exit)

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SEARCH BY LAND USE CODE:
110

LAND USE GROUP:
(100-199) Industrial

LAND USE:
110 - General Light Industrial

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
Employees

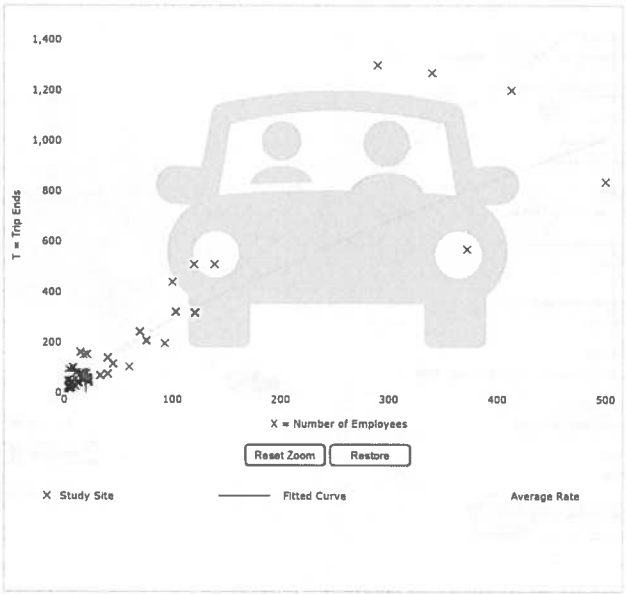
TIME PERIOD:
Weekday

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
20 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
General Light Industrial (110) Click for more details

Independent Variable:
Employees

Time Period:
Weekday

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
40

Avg. Num. of Employees:
80

Average Rate:
3.05

Range of Rates:
1.53 - 23.50

Standard Deviation:
1.64

Fitted Curve Equation:
Ln(T) = 0.77 Ln(X) + 2.13

R^2:
0.85

Directional Distribution:
50% entering, 50% exiting

Calculated Trip Ends:
Average Rate: 61 (Total), 30 (Entry), 31 (Exit)
Fitted Curve: 84 (Total), 42 (Entry), 42 (Exit)

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SEARCH BY LAND USE CODE:
110

LAND USE GROUP:
(100-199) Industrial

LAND USE :
110 - General Light Industrial

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
Employees

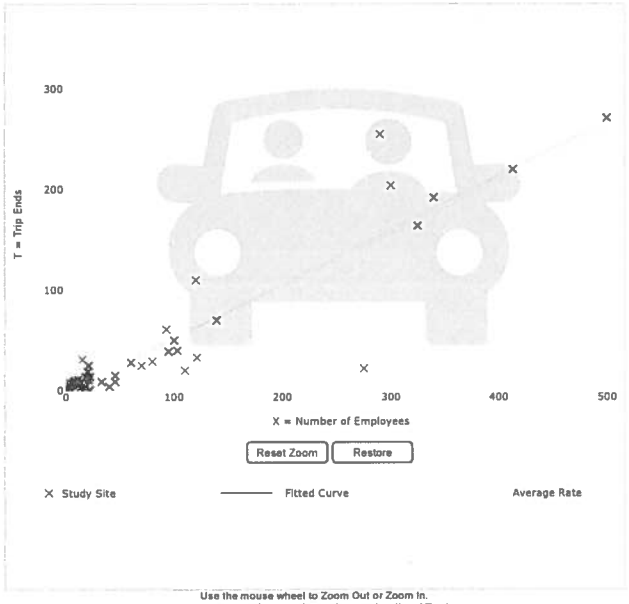
TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
20
Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
General Light Industrial (110) Click for more details

Independent Variable:
Employees

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
44

Avg. Num. of Employees:
91

Average Rate:
0.52

Range of Rates:
0.05 - 2.07

Standard Deviation:
0.26

Fitted Curve Equation:
T = 0.54(X) + 2.20

R^2:
0.85

Directional Distribution:
83% entering, 17% exiting

Calculated Trip Ends:
Average Rate: 10 (Total), 8 (Entry), 2 (Exit)
Fitted Curve: 9 (Total), 7 (Entry), 2 (Exit)

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SEARCH BY LAND USE CODE:
110

LAND USE GROUP:
(100-199) Industrial

LAND USE :
110 - General Light Industrial

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
Employees

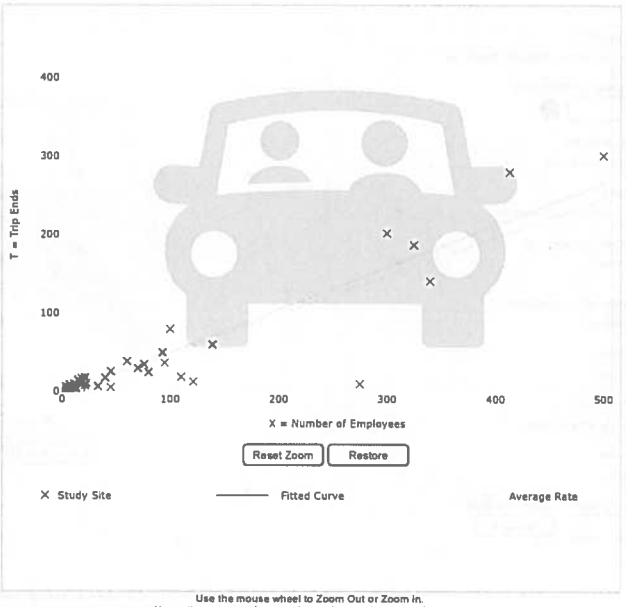
TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
20 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom in.
Hover the mouse pointer on data points to view X and T values

DATA STATISTICS

Land Use:
General Light Industrial (110) Click for more details

Independent Variable:
Employees

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
42

Avg. Num. of Employees:
84

Average Rate:
0.49

Range of Rates:
0.04 - 2.33

Standard Deviation:
0.23

Fitted Curve Equation:
T = 0.54(X) + 3.96

R^2:
0.85

Directional Distribution:
22% entering, 78% exiting

Calculated Trip Ends:
Average Rate: 10 (Total), 2 (Entry), 8 (Exit)
Fitted Curve: 7 (Total), 2 (Entry), 5 (Exit)

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SEARCH BY LAND USE CODE:
110

LAND USE GROUP:
(100-199) Industrial

LAND USE:
110 - General Light Industrial

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
Employees

TIME PERIOD:
Saturday

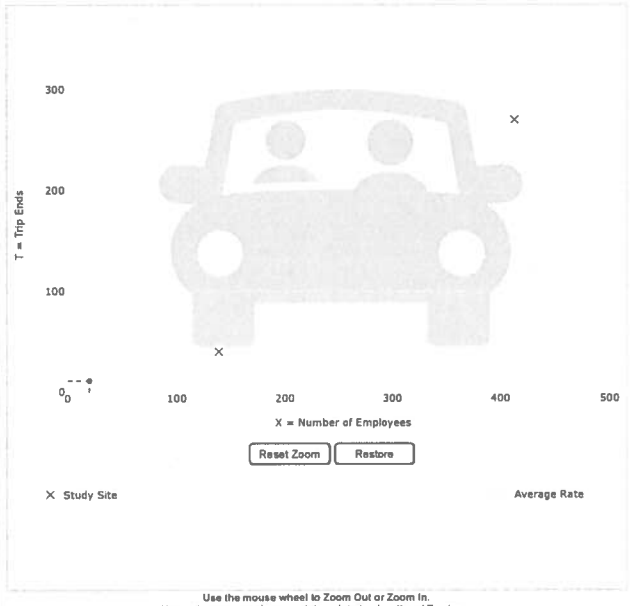
SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
20
Calculate

Data Plot and Equation

Caution – Small Sample Size



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
General Light Industrial (110) Click for more details

Independent Variable:
Employees

Time Period:
Saturday

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
2

Avg. Num. of Employees:
276

Average Rate:
0.56

Range of Rates:
0.29 - 0.65

Standard Deviation:
****

Fitted Curve Equation:
Not Given

R^2:
****

Directional Distribution:
50% entering, 50% exiting

Calculated Trip Ends:
Average Rate. 11 (Total), 5 (Entry), 6 (Exit)

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DATA SOURCE:
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SEARCH BY LAND USE CODE:
110

LAND USE GROUP:
(100-199) Industrial

LAND USE:
110 - General Light Industrial

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
Employees

TIME PERIOD:
Saturday, Peak Hour of Generator

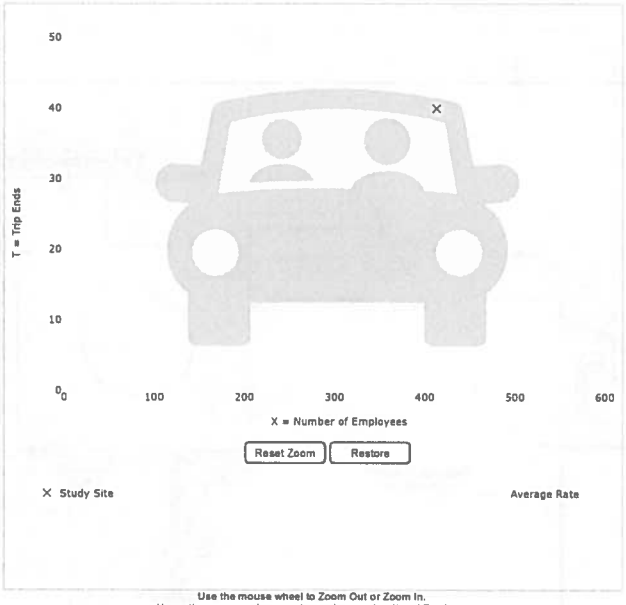
SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
20 Calculate

Data Plot and Equation

Caution -- Small Sample Size



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
General Light Industrial (110) Click for more details

Independent Variable:
Employees

Time Period:
Saturday
Peak Hour of Generator

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
1

Avg. Num. of Employees:
413

Average Rate:
0.10

Range of Rates:
0.10 - 0.10

Standard Deviation:
****

Fitted Curve Equation:
Not Given

R^2:
****

Directional Distribution:
47% entering, 53% exiting

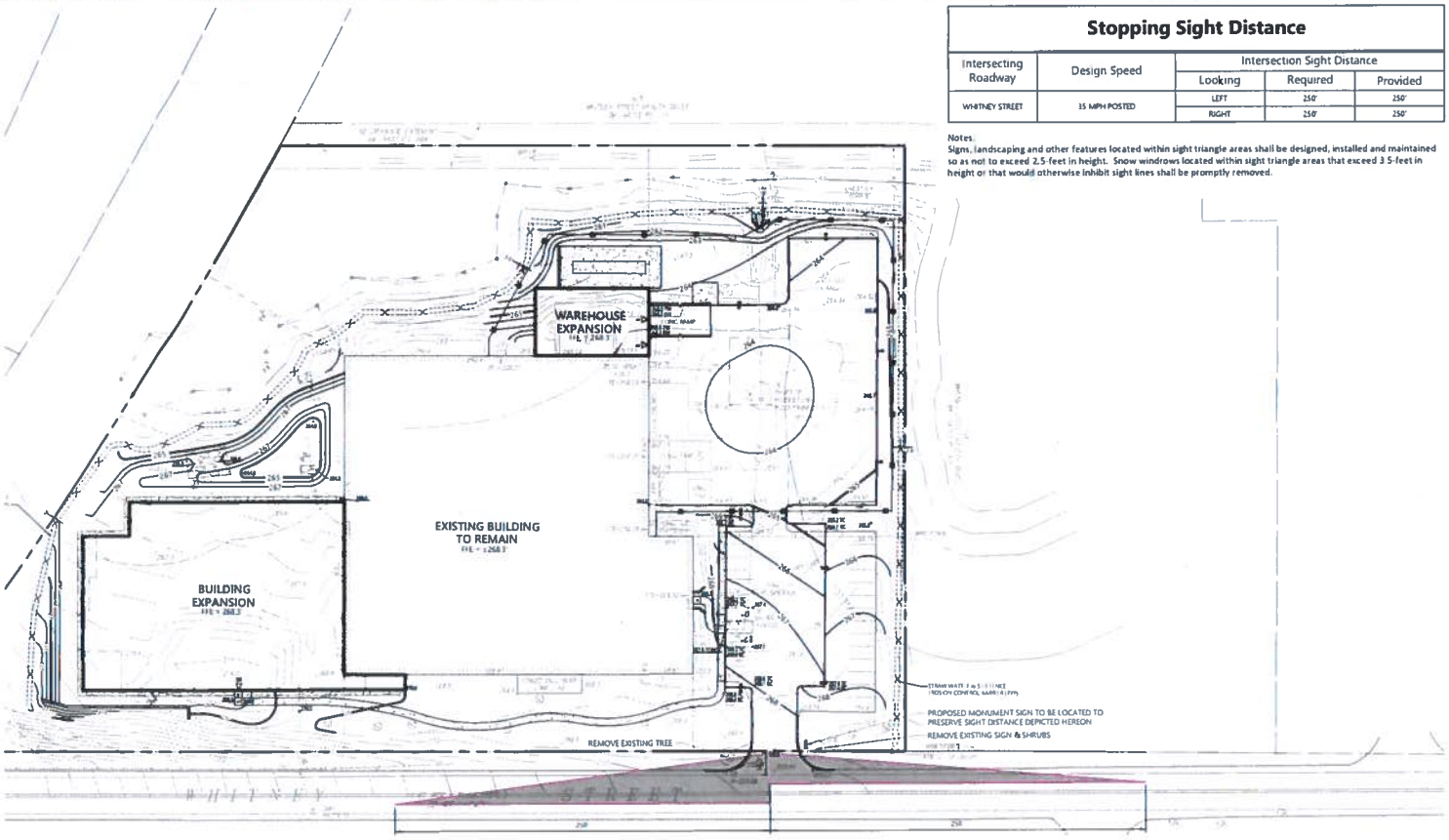
Calculated Trip Ends:
Average Rate: 2 (Total), 1 (Entry), 1 (Exit)

\\vhb.com\gbl\proj\Worcester\14500.00 Steris\cad\dt\Engr\Sight Distance Graphics\14500.00 Intersection Sight Distance.dwg

Stopping Sight Distance

Intersecting Roadway	Design Speed	Intersection Sight Distance		
		Looking	Required	Provided
WHITNEY STREET	35 MPH POSTED	LEFT	250'	250'
		RIGHT	250'	250'

Notes:
Signs, landscaping and other features located within sight triangle areas shall be designed, installed and maintained so as not to exceed 2.5-feet in height. Snow windrows located within sight triangle areas that exceed 3 5-feet in height or that would otherwise inhibit sight lines shall be promptly removed.



0 30 60 120 Feet

vhb

Stopping Sight Distance
Facility Expansion Project
425 Whitney Street
Northborough, MA

Figure 1

March 2021